

THE PORT AUTHORITY
OF NY & NJ

ENGINEERING PROGRAM MANAGER
WORLD TRADE
CHIEF ELECTRICAL ENGINEER

No. Date Revision Approved

Engineering Department
Design Division
The World Trade
Center

Fire Alarm System
Phase III
XL3 Conversion
Electrical
1 and 2 WTC
Legend, Abbreviations,
Key Plan and
General Notes

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

ROYZMAN
FELDSTEIN ROYZMAN
Designed by Drawn by Checked by

Date 5-20-99 Scale NONE

Contract Number Drawing Number
WTC-861082 E-1

LEGEND

- HEAVY LINE INDICATES WORK TO BE DONE
- HEAVY DASHED & DOTTED LINE INDICATES NEW CABLE(S) ROUTED IN EXIST. CONDUIT
- DASHED LINE INDICATES DEVICE AND/OR CIRCUITRY TO BE REMOVED
- LIGHT LINE INDICATES EXISTING TO REMAIN

XNET XNET PANEL
14/2 INDICATES 1 PAIR #14 AWG TWISTED
XXX-XXX ALD LOOP NUMBER - DEVICE ADDRESS NUMBER OR NAME

- ADDRESSABLE PULL STATION, PYROTRONICS MODEL #MSI-CS2 METAL, SURFACE MOUNTED, WITH BACKBOX MS-SB, CLASS E WITH NYC WHITE STRIP, WITHOUT SUBSTITUTION, FURNISHED BY THE AUTHORITY AND INSTALLED BY THE CONTRACTOR.
- ADDRESSABLE INTELLIGENT PHOTO THERMAL-FIREPRINT AREA SMOKE DETECTOR PYROTRONICS MODEL #FP-11 WITH BASE #DB-11, WITHOUT SUBSTITUTION.
- ADDRESSABLE INTELLIGENT PHOTO THERMAL-FIREPRINT DUCT SMOKE DETECTOR PYROTRONICS MODEL #FP-11 WITH HOUSING PYROTRONICS MODEL #AD-3LP AND SAMPLING TUBE PYROTRONICS MODEL #STA-X, WITHOUT SUBSTITUTIONS. THE SAMPLING TUBE SIZE TO BE FIELD SELECTED BASED ON THE DUCT SIZE.
- PYROTRONICS MODEL TRI-B6R ADDRESSABLE INTERFACE SWITCH MODULE MOUNTED IN 6"x6"x4" ENCLOSURE, WITHOUT SUBSTITUTION.
- PYROTRONICS MODEL TRI-B6 ADDRESSABLE INTERFACE SWITCH MODULE MOUNTED IN 6"x6"x4" ENCLOSURE, WITHOUT SUBSTITUTION.
- PYROTRONICS MODEL TRI-B6D DUAL ADDRESSABLE INTERFACE SWITCH MODULE MOUNTED IN 6"x6"x4" ENCLOSURE, WITHOUT SUBSTITUTION.
- PYROTRONICS MODEL TRI-B6 ADDRESSABLE INTERFACE SWITCH MODULE MOUNTED IN EXISTING ENCLOSURE, WITHOUT SUBSTITUTION.
- 4 11/16" SQ. PULL BOX
- EXISTING TAMPER SWITCH
- EXISTING WATER FLOW SWITCH
- EXISTING PURGE SWITCH
- EXISTING PULL BOX
- EXISTING DELUGE SOLENOID VALVE
- EXISTING MANUAL PULL STATION TO BE REMOVED
- EXISTING SMOKE DETECTOR TO BE REMOVED, NUMBER INDICATES EXIST. ADDRESS
- EXISTING DUCT DETECTOR TO BE REMOVED, NUMBER INDICATES EXIST. ADDRESS
- EXISTING ALARM BELL TO BE REMOVED
- EXISTING TROUBLE HORN TO BE REMOVED
- EXISTING REMOTE ALARM LAMP TO BE REMOVED
- EXISTING SPEAKER

CABLE LEGEND:

- NUMBER OF CABLES
A, B OR C
- TYPE OF CABLE
A - 2#14 AWG WIRE (PAIR) TWISTED SHIELDED TEFLON CABLE
B - 2#16 AWG WIRE (PAIR) TWISTED SHIELDED TEFLON CABLE
C - 2#14 AWG WIRE (PAIR) TWISTED UNSHIELDED TEFLON CABLE

CIRCUIT LEGEND:

- TYPE OF CIRCUIT
ALD - ALD LOOP
EL/TL - ELECTRIC AND TELEPHONE CLOSET ALD CONNECTION
- CIRCUIT DESIGNATION NUMBER

ABBREVIATIONS

ADDR.	ADDRESS (FOR PORT AUTHORITY PLANT & STRUCTURE USE.)
ALD	ANALOG LOOP DRIVER
ACS-SS-4	AIR CONDITIONING SUPPLY UNIT #SS-4
CAB.	CABINET
CKTRY	CIRCUITRY
CKT	CIRCUIT
DWG	DRAWING
E.O.L.	END OF LINE (24KA) RESISTOR (PROVIDED BY PORT AUTHORITY INSTALLATION BY CONTRACTOR).
EXIST.	EXISTING
FA	FIRE ALARM
FL	FLOOR
GSC	GALVANIZED STEEL CONDUIT
IC	INTERFACE, CABINET
MCC	MOTOR CONTROL CENTER
MER	MECHANICAL EQUIPMENT ROOM
N.T.S.	NOT TO SCALE
NE	NORTH-EAST
NS	NORTH-SOUTH
O.A.E.	OR APPROVED EQUAL
PNL	PANEL
PB	PULL BOX
RM	ROOM
SD	SMOKE DETECTOR
SOL	SOLENOID
SE	SOUTH-EAST
SW	SOUTH-WEST
TEL	TELEPHONE
TSC	TERMINAL STRIP CABINET
TRI	INTERFACE MODULE OF MXLV SYSTEM
TYP	TYPICAL
TRX	INTERFACE MODULE OF XL3 SYSTEM
U.O.N.	UNLESS OTHERWISE NOTED
WTC	WORLD TRADE CENTER
XL3	EXIST. FA PANEL

GENERAL NOTES

- ALL FIRE ALARM CABLES SHALL BE TYPE FPLP-UL TWISTED PAIR #14 GAUGE, (100% SOLID COPPER, 200°C, 60V, SHIELDED (EXCEPT UNSHIELDED FOR SPEAKERS) CONDUCTORS CLASS F, BSA AND MEA APPROVED FOR NYC LOCAL LAW #5 WITH TEF (TEFLON OR APPROVED EQUAL) INSULATION, AND CONDUCTORS COLORED BLACK & RED INSTALLED ABOVE HANG CEILING UNLESS OTHERWISE NOTED. ALL OPEN AREA AND MEAS WILL UTILIZE CONDUITS.
- ALL 120 VAC WIRING SHALL BE TYPE XHHW-WV-2 90°C, 600V SUITABLE FOR WET AND DRY LOCATIONS, UNLESS OTHERWISE NOTED.
- ALL CONDUITS SHALL BE RIGID STEEL, HOT DIPPED GALVANIZED WITH THREADED FITTINGS, UNLESS OTHERWISE NOTED.
- ALL RACEWAY, ENCLOSURES & BOXES SHALL BE GROUNDED IN AN APPROVED MANNER.
- GROUND BUSHING SHALL BE INSTALLED ON ALL CONDUITS PENETRATING ENCLOSURES.
- ALL PENETRATIONS MADE IN EXISTING EQUIPMENT SHALL BE MADE IN THE PRESENCE OF THE ENGINEER.
- FINAL CONNECTIONS AT THE XNET CABINET, TSC, XL3, INTERFACE CABINET & EXISTING SPEAKERS SHALL BE DONE BY THE CONTRACTOR IN THE PRESENCE OF THE ENGINEER.
- SHAPING AND LABELING OF CABLES AT THE EXISTING XNET, TSC, XL3 AND INTERFACE CABINET WILL BE PERFORMED BY THE CONTRACTOR. THIS WORK SHALL BE DONE IN THE PRESENCE OF THE ENGINEER.
- PATCH & SEAL ALL PENETRATIONS FROM ALL CONDUITS PASSING THRU WALLS, AND PLENUMS WITH THERMAFIBER OR IPCC FLAME-SAFE.
- CONTRACTOR SHALL USE BRADY LABELS #WAL-205-292-1 (O.A.E.) FOR LABELLING OF ALL CONDUITS.
- ALL BOX COVERS, CONDUIT COVERS, ETC. SHALL BE PAINTED RED. USE A 2" STENCIL AND WHITE PAINT ON ALL COVERS INDICATING SYSTEM DESIGNATION (EXAMPLE "1" FOR 1 WTC AND "2" FOR 2 WTC DESIGNATION, ETC.) PROVIDE A SAMPLE FOR APPROVAL.
- ROUTING OF CONDUITS ON DRAWINGS E-3, E-7, E-11, E-15, E-19, E-23, E-27, E-31, E-35, E-39 AND E-43 THRU E-54 ARE FOR GENERAL INFORMATION. CONTRACTOR SHALL BE RESPONSIBLE FOR ACTUAL FIELD VERIFICATION AND ROUTING OF ALL CONDUITS.
- UPON INSTALLATION AND 24 HOUR NOTICE TO THE ENGINEER, FIRE ALARM CABLES SHALL BE TESTED IN THE PRESENCE OF THE ENGINEER, IN ACCORDANCE TO THE AUTHORITY'S SPECIFICATION #16910. ALL TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- INSTALL NEW AREA SMOKE DETECTORS IN EXISTING ACS UNITS BETWEEN FILTERS AND REHEAT COILS. SEE TYPICAL DETAIL "A" ON DWG E-56.
- EXISTING FAN SHUTDOWN AND SOLENOID VALVES CIRCUIT WIRING FROM XL3 CABINET TO DEVICES REMAIN AND BE EXTENDED TO INTERFACE PANEL. EXISTING BACK BOX AND TERMINALS OF XL3 PANELS TO BE USED AS TERMINAL BOX FOR EXTENSION OF FAN SHUTDOWN & SOLENOID VALVE CIRCUITS. (SEE DWG'S E-5, E-9, E-13, E-17, E-21, E-25, E-29, E-33, E-37 AND E-41).
- TEST ALL REELS OF FIRE ALARM CABLE FOR CONTINUITY AND SHORTS, PRIOR TO INSTALLATION.
- AFTER INSTALLATION, TESTING AND TURNING ON NEW FIRE ALARM SYSTEM, UNDER THE DIRECTION OF THE ENGINEER, CONTRACTOR SHALL REMOVE EXISTING FIRE ALARM SYSTEM XL3 AREA & DUCT SMOKE DETECTORS, REMOTE ALARM LAMPS, PULL STATIONS, ALARM BELLS, TROUBLE HORNS, AND ASSOCIATED WIRING AND CONDUITS BACK TO XL3 PANELS, ALL INTERNAL COMPONENTS AND WIRING FROM THE EXISTING XL3 PANELS, EXCEPT MENTIONED IN NOTE 15 ON THIS DRAWING. (SEE DWG'S E-4, E-8, E-12, E-16, E-20, E-24, E-28, E-32, E-36, E-40 AND E-43 THRU E-54). CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSAL OF ALL REMOVED MATERIAL.
- DISCONNECT, TAG, TAPE AND ABANDON IN CONDUIT EXISTING ALD LOOP WIRING, (PRESENTLY RUNNING IN SAME CONDUIT WITH FAN SHUTDOWN AND SOLENOID VALVE CONDUCTORS).
- UNDER THE DIRECTION OF ENGINEER, REMOVE EXISTING CONDUCTORS FROM XL3 PANELS TO: RMT AND IC IN ELECTRICAL CLOSET "C". (SEE DWG'S E-4, E-8, E-12, E-16, E-20, E-24, E-28, E-32, E-36 AND E-40).
- PROGRAMMING OF ALL ADDRESSABLE DEVICES WILL BE DONE BY THE CONTRACTOR. FINAL CONFIRMATION OF ADDRESSES SHALL BE AS DIRECTED BY THE ENGINEER, PRIOR TO PROGRAMMING DEVICES.
- THE AUTHORITY HAS DETERMINED THAT THE FOLLOWING AREAS HAVE ASBESTOS CONTAINING SPRAYED ON FIREPROOFING ON THE CEILING DECKING ABOVE EACH ENTIRE FLOOR:
1 WTC - 7th FLOOR MER, 41st FLOOR MER & 75th FLOOR MER
2 WTC - 7th FLOOR MER, 41st FLOOR MER, 75th FLOOR MER & 109th FLOOR MER
ATTACH THE ELECTRICAL CONDUIT TO EXISTING HANGERS ON RUN ALONG EXISTING WALLS IN ORDER TO AVOID ENCOUNTERING ANY OVERHEAD ASBESTOS CONTAINING MATERIAL.
- IF ASBESTOS CONTAINING MATERIAL IS ENCOUNTERED IN AREAS OTHER THAN THOSE LISTED IN NOTE 21 AND IF DIRECTED BY THE ENGINEER TO REMOVE SUCH ASBESTOS CONTAINING MATERIAL AND REPLACE SUCH MATERIAL WITH NON-ASBESTOS CONTAINING MATERIAL, THE CONTRACTOR SHALL REMOVE SUCH ASBESTOS CONTAINING MATERIAL AND REPLACE SUCH MATERIAL WITH NON-ASBESTOS CONTAINING MATERIAL. THE CONTRACTOR WILL BE COMPENSATED FOR REMOVING SUCH ASBESTOS CONTAINING MATERIAL AND REPLACING SUCH MATERIAL WITH NON-ASBESTOS CONTAINING MATERIAL AT THE NET COST OF SUCH WORK.
- "NET COST" SHALL BE COMPUTED IN THE SAME MANNER, AS IS COMPENSATION FOR EXTRA WORK, INCLUDING ANY PERCENTAGE ADDITION TO COST, AS SET FORTH IN THE CLAUSE OF THE CONTRACT PROVIDING COMPENSATION FOR EXTRA WORK. PERFORMANCE OF SUCH NET COST WORK SHALL BE SUBJECT TO ALL PROVISIONS OF THE CONTRACT RELATING TO PERFORMANCE OF EXTRA WORK. COMPENSATION FOR SAID NET COST WORK SHALL NOT BE CHARGED AGAINST THE TOTAL AMOUNT OF COMPENSATION AUTHORIZED FOR EXTRA WORK.

DUCT MOUNTED SMOKE DETECTORS PLACEMENT CRITERIA

- DUCT MOUNTED SMOKE DETECTORS SHALL BE PLACED AND INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS AND THE 1990 EDITION OF NFPA 72E, STANDARD ON AUTOMATIC FIRE DETECTORS.
- SELECTION AND TRIALING OF SAMPLING TUBE LENGTH SHALL BE BASED ON THE DUCT WIDTH WHERE THE DUCT MOUNTED SMOKE DETECTOR IS INSTALLED, CONFORMING TO MANUFACTURER'S RECOMMENDATIONS.
- DUCT MOUNTED SMOKE DETECTORS SHALL ONLY BE INSTALLED IN STRAIGHT RUN OF DUCT WITH A MINIMUM LENGTH OF 36".
- INSTALL SMOKE DETECTOR AT THE CENTER LINE OF THE DUCT HEIGHT AND AS CLOSE AS POSSIBLE TO SIX (6) DUCT WIDTHS FROM ANY BENDS OR CONNECTIONS, WHERE SUCH CONDITION IS NOT FEASIBLE, SMOKE DETECTOR SHALL BE INSTALLED AT THE MID POINT OF THE STRAIGHT RUN.
- FOR ANY SMOKE DETECTOR ASSOCIATED WITH RETURN AIR FAN (ACR) OR EXHAUST FAN (E), ONLY ONE (1) SMOKE DETECTOR WILL BE REQUIRED, TO BE INSTALLED AT THE STRAIGHT DUCT, DOWNSTREAM OF THE AIRFLOW FROM THE FAN.
- DUCT MOUNTED SMOKE DETECTOR SHALL BE INSTALLED AT LEAST 12" AWAY FROM ANY EXISTING DETECTORS.
- THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE ENGINEER PRIOR TO ANY INSTALLATION THAT DEVIATES FROM THE ABOVE CRITERIA.

I HEREBY CERTIFY THAT THIS IS A TRUE AND CORRECT COPY OF ONE OF THE CONTRACT DRAWINGS CONSTITUTING A PART OF CONTRACT NO. WTC-861082 IN THE FORM IN WHICH SAID DRAWINGS EXISTED AT THE TIME THE SAID CONTRACT WAS EXECUTED BY THE PARTIES.
DATE 5/10/00 CONTRACT ENGINEER
DATE 5/10/00 ENGINEERING PROGRAM MGR.

